

SECTION A (40 Marks)

Compulsory: To be attempted by all candidates.

Question 1

(a) *Directions: Each question in this part is followed by four possible choices of answers. Choose the correct answer and write it in the space provided in the question booklet.* [15]

(i) The element having the largest atomic size is

- A francium.
- B fluorine.
- C chlorine.
- D lithium.

Answer:.....

(ii) Which of the following statements characterises an electrovalent compound?

- A Insoluble in water.
- B Low melting and boiling points.
- C High melting and boiling points.
- D Electrons are shared between the atoms of the element.

Answer:.....

(iii) When phenolphthalein solution is added to an acid, the colour change that takes place is

- A colourless to orange.
- B remains colourless.
- C colourless to pink.
- D colourless to red.

Answer:.....

(iv) The volume occupied by 16 grams of oxygen molecules at S.T.P is

- A 11. 2 litre.
- B 22. 4 litre.
- C 33. 6 litre.
- D 44. 8 litre.

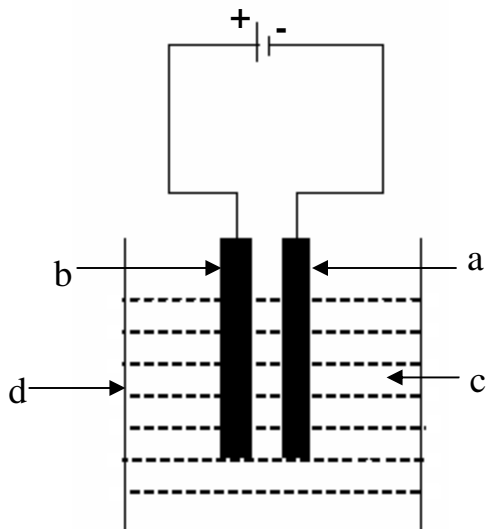
Answer:.....

(v) In the equation $2\text{H}_2\text{S} + \text{SO}_2 \rightarrow 3\text{S} + 2\text{H}_2\text{O}$, sulphur dioxide acts as

- A a reducing agent.
- B a bleaching agent.
- C an oxidising agent.
- D a dehydrating agent.

Answer:.....

(vi) In the diagram shown below, the parts labelled correctly is



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|----------|-------------|-------------|-----------------------|------------------------|
| A | a – cathode | b – anode | c – electrolyte | d – electrolytic cell. |
| B | a – anode | b – cathode | c – electrolyte | d – electrolytic cell. |
| C | a– cathode | b– anode | c – electrolytic cell | d – electrolyte. |
| D | a – anode | b – cathode | c – electrolytic cell | d – electrolyte. |

Answer:.....

(vii) The alloy used for making medals and statues is

- A stainless steel.
- B german silver.
- C bronze.
- D brass.

Answer:.....

(viii) The percentage composition of potassium in the compound potassium nitrate is

- A 32.5 %.
- B 34.3 %.
- C 36.5 %.
- D 38.6 %.

Answer:.....

(ix) Sodium hydroxide is a strong base as its aqueous solution contains a high concentration of

- A hydronium ion.
- B hydroxyl ion.
- C hydrogen ion.
- D sodium ion.

Answer:.....

(x) When the empirical formula of a compound is $C_2H_3O_3$ and its vapour density 73, the molecular formula of the compound will be

- A $C_2H_3O_3$.
- B $C_2H_4O_6$.
- C $C_4H_2O_6$.
- D $C_4H_4O_8$.

Answer:.....

(xi) When ammonium chloride reacts with slaked lime in the presence of heat, a gas is produced. This gas which turns red litmus blue and is highly soluble in water is

- A hydrogen chloride.
- B ammonia.
- C hydrogen.
- D oxygen.

Answer:.....

(xii) The common name of the compound C_2H_5OH is

- A methyl alcohol.
- B propyl alcohol.
- C ethyl alcohol.
- D butanol.

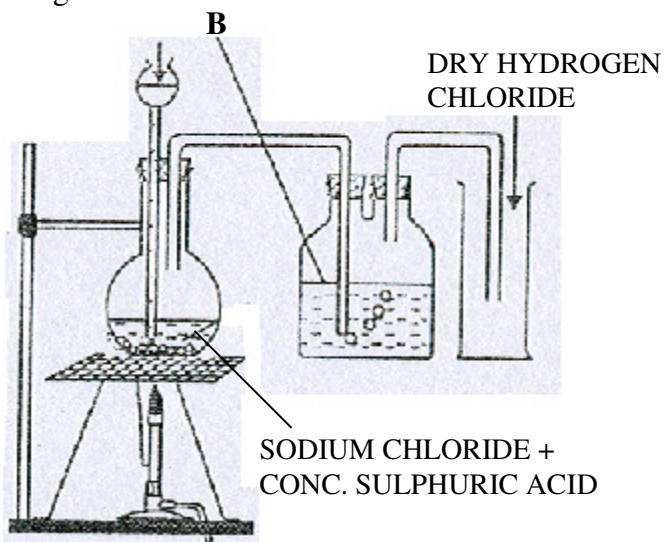
Answer:.....

(xiii) In the periodic table, beryllium, magnesium, calcium and strontium belong to the family of

- A halogens.
- B alkali metals.
- C transition metals.
- D alkaline earth metals.

Answer:.....

(xiv) In the diagram given below the solution in container **B** is



- A concentrated sulphuric acid.
- B lime water.
- C nitric acid.
- D water.

Answer:.....

(xv) Ethyl alcohol reacts with excess amount of concentrated sulphuric acid at 170°C and a gas 'X'. The gas 'X' is

- A ethane.
- B ethene.
- C ethyne.
- D methane.

Answer:.....

(b) *Fill in the blanks with appropriate words.* [6]

- (i) The molecular weight of a gas is its vapour density.
- (ii) The bond formed between the oxygen atom of water and hydrogen ion is called
- (iii) The only products formed during a reaction is salt and water.
- (iv) Ammonia is manufactured in the industries by
- (v) Haematite is an ore of
- (vi) The bleaching action of sulphur dioxide is due to it's property.

(c) *Match each item under Column A with the most appropriate item in Column B. You must rewrite the correct matching pairs in the spaces provided below.* [6]

Column A	Column B
(i) Periodic table	(a) alkane
(ii) Reddish brown precipitate	(b) fertilizers
(iii) 2 moles of ammonia	(c) alkene
(iv) Aluminium	(d) brown gas
(v) C _n H _{2n}	(e) ferrous hydroxide
(vi) Nitrogen dioxide	(f) atomic weight
	(g) electrolytic process
	(h) ferric hydroxide
	(i) 44.8L
	(j) atomic number

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(d) *Correct the following statements by changing only the underlined words. Rewrite the correct statements.*

(i) The conversion of ethene to ethane is an example of substitution reaction.

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(ii) Sulphur dioxide gas has a foul smell of rotten eggs.

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(iii) If the volume occupied by 44g of carbon dioxide is X litres at S.T.P, then the volume occupied by 1g of hydrogen will be 2X litres.

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(iv) During the electroplating of an article with nickel, copper ions should be present in the electrolyte.

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(v) The slag formed during the extraction of iron in the blast furnace is calcium carbonate.

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(vi) When copper reacts with dilute sulphuric acid hydrogen gas is produced.

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(e) Answer the following questions.

(i) An element X can be represented as ${}_8X^{16}$. Study the element carefully and answer the following questions.

1. Write down the electronic configuration of the element X. [½]

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2. Which period and group does the element belong to? [1]

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3. What is the valency of the element X? [½]

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(ii) From the following ions: Al^{3+} , Cu^{2+} , Pb^{2+} and Zn^{2+} , which ion forms a blue precipitate (hydroxide) that does not dissolve in excess of sodium hydroxide? [1]

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(iii) Calculate the molecular weights of the following compounds.

1. $CuSO_4 \cdot 5H_2O$ [1]

2. $K_2Cr_2O_7$ [1]

(iv) Explain how the reaction at the anode differs during the electrolysis of copper sulphate using:

1. copper electrodes. [1]

2. platinum electrodes. [1]

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SECTION B (40 Marks)
Attempt any four questions

Question 2

(a) Define the following. [1]

(i) A covalent bond

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(ii) An alkali [1]

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(iii) Why does a rose petal lose its colour when placed in moist sulphur dioxide? [1]

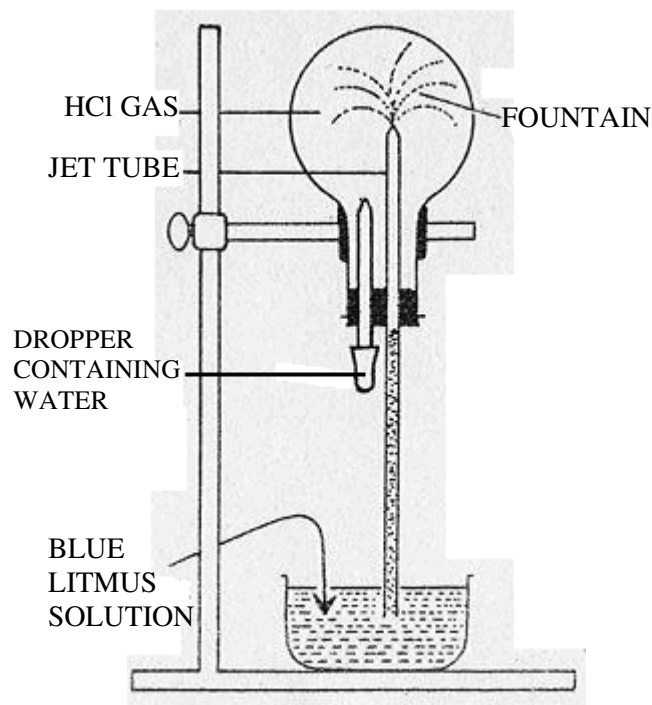
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(b) A compound X contains by mass 12.8% carbon, 2.13% hydrogen and 85.1% bromine.
The vapour density of X is 94.

(i) Calculate the empirical formula of the compound X . [2]

(ii) Calculate the molecular formula of the compound X . [2]

(c) (i) Study the diagram given below and answer the questions that follow.



1. What is the colour of the fountain inside the inverted flask? Explain the colour change. [1]

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2. Which property of the gas does the above experiment demonstrate? [1]

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(ii) State *two* uses of methanol. [1]

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Question 3

(a) The table given below represents a part of the periodic table with elements P, Q, R, S, T. Study the table and answer the questions that follow.

		P		
	Q	R	S	
		T		

(i) Name *two* elements that are in the same [1]

1. group.
2. period.

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(ii) Within the same group, which element is the most metallic? [½]

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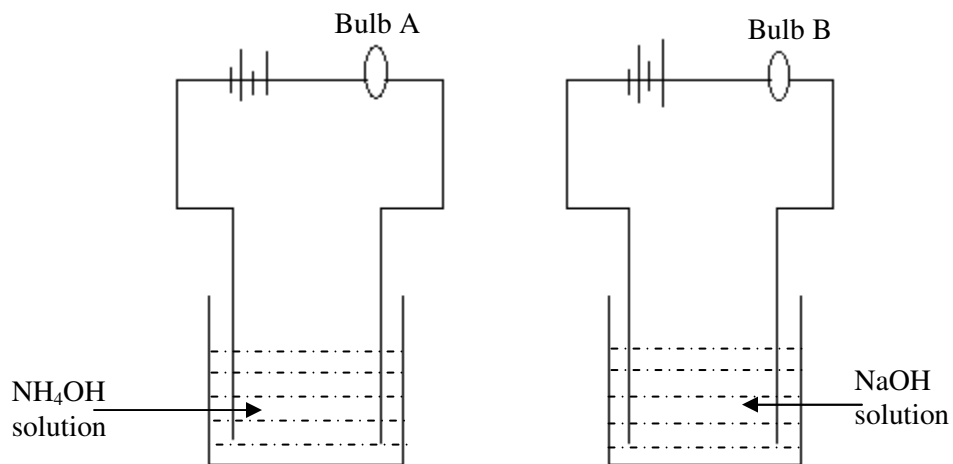
(iii) Name the element which is the most non-metallic. [½]

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(iv) State any *two* periodic properties that decrease down a group. [1]

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(b) An electrolysis experiment was carried out using two different electrolytes as shown in the diagram below. Study the diagrams and answer the questions that follow.



(i) Which bulb A or B glows more brightly? Why? [1]

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(ii) Which electrolyte contains more number of hydroxyl ions? Why? [1]

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(iii) What will happen to the brightness of the bulb A, if ammonium hydroxide is replaced by sodium chloride? [1]

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- (c) (i) During a Science practical class, each student was given two un-labelled test- tubes. Both the test- tubes contained a gelatinous white precipitate. Explain how the students can prove that one test- tube contains aluminium hydroxide and other test- tube contains zinc hydroxide. [2]

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- (ii) Name the catalyst used during the catalytic oxidation of ammonia. [1]

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- (iii) Define the term 'Homologous Series'. [1]

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Question 4

- (a) Give *one* example each for the following. [1]
- (i) A weak acid used in fizzy drinks. [1]

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- (ii) A hydroxide which is insoluble in water. [1]

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- (b) Complete the following equations. [3]



(c) The electrolysis of acidified water is carried out in a Hoffman's voltameter.

(i) Why is sulphuric acid added to water?

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(ii) Write down the reactions that take place at the cathode and anode. [1]

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(iii) What is the ratio of the volume of the two gases formed during the electrolysis of acidified water ? [1]

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(d) Explain why:

(i) ammonia solution is used as a cleansing agent? [1]

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(ii) newspapers turn yellow when exposed to air for a long time? [1]

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Question 5

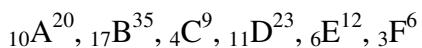
(a) (i) State Gay-Lussac's Law. [1]

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(ii) Which metal is the most suited for making transmission wires? Give reasons.

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(b) Study the elements given below and answer the questions that follow:



(i) Name the element which has the: [½]

1. lowest electro negativity.

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2. highest ionisation potential. [½]

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(ii) Write down the electronic configuration of the element: [½]

1. $_{11}\text{D}^{23}$

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2. $_{3}\text{F}^6$ [½]

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(iii) Compare the atomic size of the elements $_{17}\text{B}^{35}$ and $_{11}\text{D}^{23}$ with reasons. [1]

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(iv) State *two* factors on which the atomic size of an element depends.

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(c) Sulphuric acid is manufactured by Contact Process.

(i) Name the catalyst used in this process. [1]

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(ii) At what temperature is the yield of sulphur trioxide maximum? [1]

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(iii) Write down the equation for the conversion of sulphur trioxide to oleum. [1]

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Question 6

(a) From the equation $\text{PbO}_2 + 4\text{HCl} \rightarrow \text{PbCl}_2 + 2\text{H}_2\text{O} + \text{Cl}_2$,

(i) what volume of chlorine will be liberated by the action of 9.56g of lead (IV) oxide on hydrochloric acid? [1½]

(ii) calculate the mass of lead chloride formed at the same time.

(b) (i) Draw the electron dot diagram of the following. [2]

1. When magnesium combines with chlorine to form a magnesium chloride molecule.

2. When nitrogen combines with hydrogen to form an ammonia molecule.

(ii) Write down the name and symbol of the metal having the following properties. [2]

1. It must be kept out of contact with air and water.

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2. It is prepared by electrolysis of its oxide.

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3. It does not react with water under any conditions.

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4. Its reaction with steam gives a magnetic oxide.

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(c) (i) Quick lime is used to dry ammonia. Why?

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(ii) What do you understand by spurious alcohol? [1]

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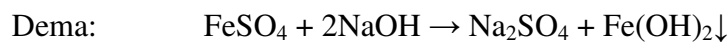
(iii) Classify the following compounds as alkanes and alkenes in the table given below. [1]

C_3H_8 , C_5H_{10} , C_6H_{14} , C_2H_4

Alkanes	Alkenes

Question 7

(a) (i) Sonam and Dema carried out an experiment based on the action of alkalis on metal salts. Sonam used 5.64g of aqueous zinc sulphate to which he added an aqueous solution of sodium hydroxide. On the other hand, Dema used 5.64g of aqueous iron sulphate to which she added an aqueous solution of sodium hydroxide. Both obtained a common compound sodium sulphate as shown in the equation below.



Compare the weight of Na_2SO_4 obtained by Sonam and Dema. [3]

(ii) Are ferrous hydroxide and zinc hydroxide soluble in water?
What are they known as?

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(iii) Explain Avogadro's law in your own words. [1]

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(b) With reference to the extraction of zinc, answer the following questions.

(i) Name any *one* ore of zinc. [½]

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(ii) 1. Write the balanced equation for the conversion of zinc carbonate to zinc oxide. [1]

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2. What is this process called? [½]

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(c) (i) Complete and balance the following equation. [1]



(ii) Justify the statement 'Organic Chemistry plays an important role in our lives'.

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Atomic weights of elements

Elements	Atomic weights	Elements	Atomic weights
Cu	64	Pb	207
S	32	Cl	35.5
O	16	Zn	65
H	1	Fe	56
K	39	Na	23
Cr	52	N	14
Br	80	C	12

for Rough Work

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